Virginia WILDLIFE

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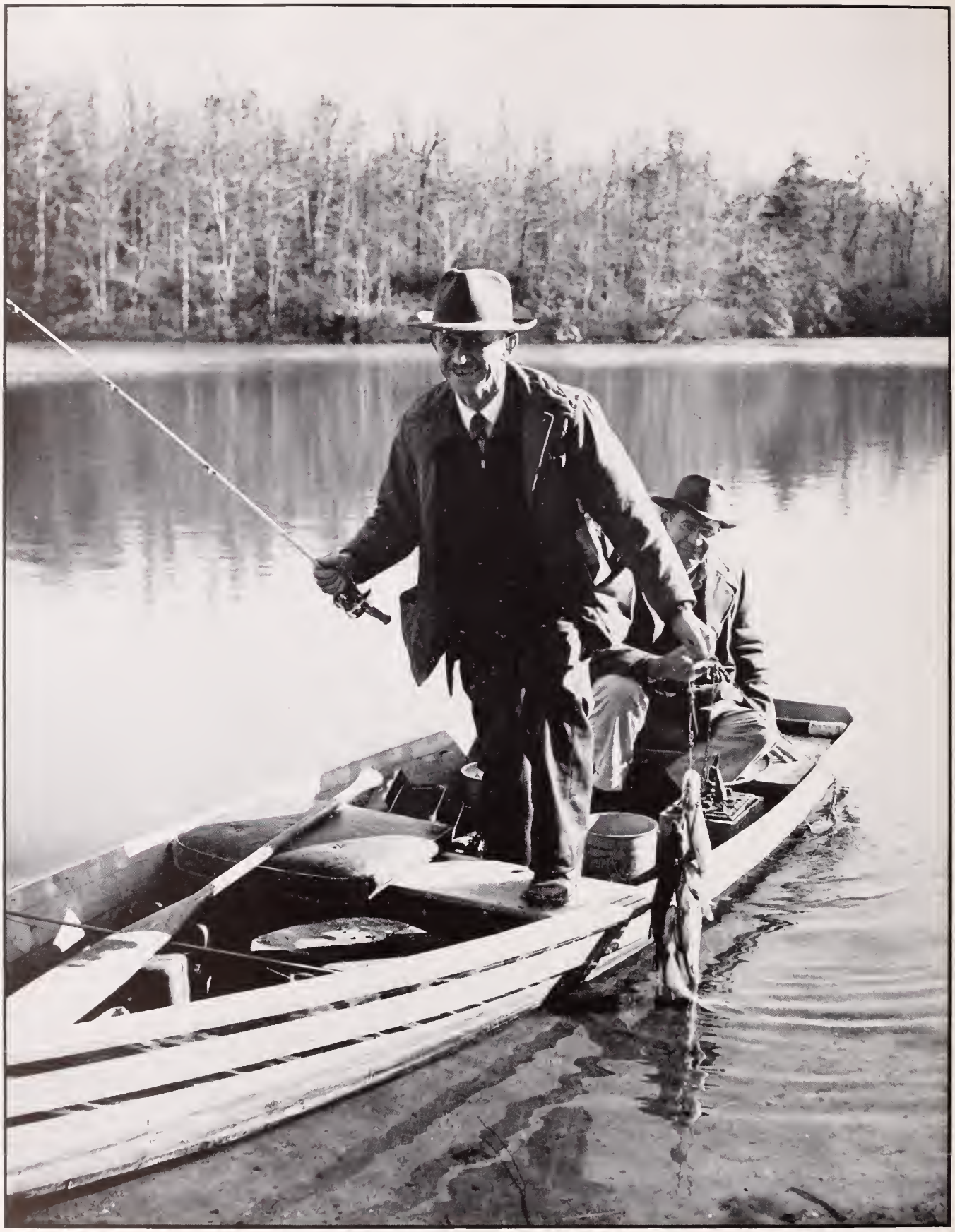

Photo by J. J. Shomon

Bass Season's Here!

Virginia WILDLIFE

Published by VIRGINIA COMMISSION OF GAME AND INLAND FISHERIES, Richmond 13, Virginia

A Monthly Magazine for Higher Standards of Outdoor Recreation Through Wildlife Conservation

COMMONWEALTH OF VIRGINIA

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In This Issue

	Page
Editorial	4
The Way to Game Abundance	5
In the Path of the Red Demon	8
Controlling Diseases in the Wild Turkey	10
Conservationgram: Essay Contest Winners	13
New Smallmouth Hatchery	14-15
Outdoor Education in Reality	16
Those Scrappy Smallmouths	18
Terror in the Moonlight	21
Field Force Notes	25
School Page	26
Certificate of Merit Awards	27

Cover Photo

The fox has thrived in Virginia from the earliest days. His shrewdness and cunning serve him well, and he is top sport to thousands of Old Dominion hunters.

Photo by: Charles W. Schwartz, Missouri

VIRGINIA WILDLIFE gratefully receives for consideration all news items, articles, photographs, sketches and other materials which deal with the use, management and study of Virginia's interrelated, renewable natural resources:

WILDLIFE

SOILS — *CONSERVE* — WATER

FORESTS

Since wildlife is a beneficiary of the work done by State and Federal land-use agencies in Virginia, editorial policy provides for recognition of their accomplishments and solicitation of their contributions. Credit is given on material published. Permission to reprint is granted provided proper credit is given.

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Father-Son Fishing Week Proclaimed

BY SPECIAL PROCLAMATION the Commission of Game and Inland Fisheries named the week of June 17-23 as "Father-Son Fishing Week" and urged all fathers to take a boy fishing and teach him a few simple rules of outdoor life and clean sportsmanship.

I. T. Quinn, executive director for the Commission, issued this proclamation last week:

"In these troublesome and uncertain times, when men and nations are engaged in a life-death struggle for freedom and a democratic way of life, it behooves every Virginian to take personal note of our God-given rights and heritages. One of the things the early colonists fought and bled for was the right to hunt and fish in a way of their own choosing.

"Hunting and fishing pursuits such as we have today in this country are distinctly American. Fish and wildlife belong to the people—each and every one of us—and not to the state or some politburo.

"Fishing is a very personal privilege and, as such, a heritage as fundamentally natural to us as the very land and trees we own.

"Realizing, therefore, the value of sport fishing for the recreation that it is, for its meaning to the youth of our Commonwealth, and for its great citizenship training value, I hereby declare, in behalf of the Virginia Commission of Game and Inland Fisheries, the week of June 17-23 as Father-Son Fishing Week, and urge every Virginia father to take his boy or boys on a fishing trip at least once during this week. Those without sons are urged to take some other boy and render him the same courtesy as if he were his own."

Here it is then. A real opportunity for every dad to really get acquainted with his boy. School will be out and he'll be hankering for something to do. Why not get him started right and let him in on the thrill of catching his first bream in the local pond?

The boy will love it and remember you for it. Under 16, he needs no license, and all he asks is a chance to get out into the open.

There are no restrictions to this activity. Every boy can go, if only somebody will take him.

The urge to catch fish is primordial and is probably America's most popular sport, and to its growing millions it is a consuming hobby.

The number of anglers in the United States has been put at different figures—anywhere from 20 to 50 million. Yet in this nerve-tightened world we need more fishermen. We need more relaxation, better health, more down-to-earth living.

A father-and-son fishing trip will do something for both. The extent of the trip makes little difference. Where one goes is also immaterial. With a little checking around, a nearby place can be found. Last month's issue of *Virginia Wildlife* carried a full double-page spread on the public fishable waters restocked by the Game Commission. There are countless other ponds and waters, some privately owned, and with the right approach almost any landowner would give a father permission to take his boy fishing.

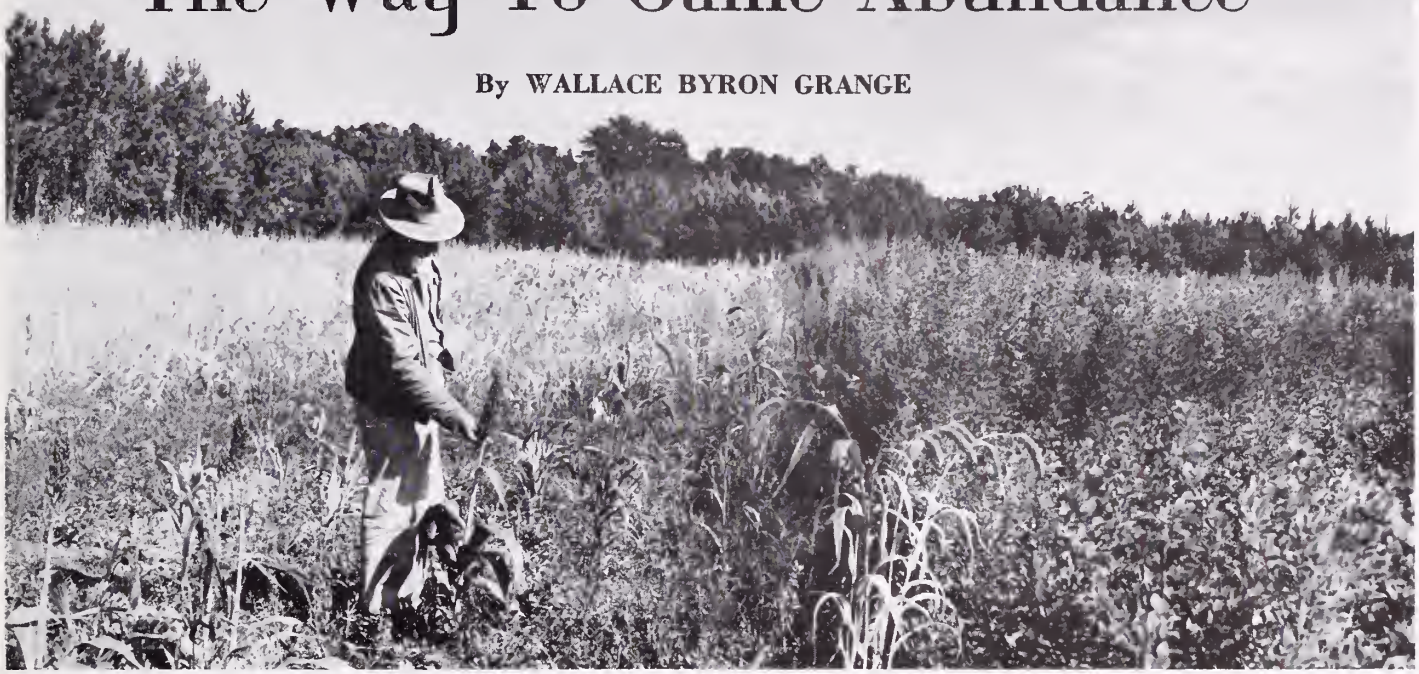
Regardless of the setting, a short jaunt into the open after panfish will prove a memorable experience. However, the trip needn't be restricted to bream and crappie. There's good bass fishing in June and the trout should be at their best. If you don't like fresh water, or are in coastal country, there are always croakers, sea trout, perch, and flounder in the bays and tidal estuaries. Or you may prefer the foamy surf and take a stab at a channel bass or striper. It's all fishing and it's all fun.

Teaching youngsters to fish will give them new vistas into life. A carefully planned father-son expedition will promote everlasting benefits: warmer friendship, mutual respect, a sense of closeness to nature and to God.

Let's not let this special week pass without taking a boy fishing.

The Way To Game Abundance*

By WALLACE BYRON GRANGE



Planting of food and cover crops throughout the Old Dominion by the Commission has increased the carrying capacity of the land.

(Photos by J. J. Shomon)

There is no sure cure, one-way, rubber-stamp success method to game abundance. Land management-habitat improvement work to provide more food and cover—that is the key that will unlock the door to Nature's treasurehouse.

THE WAY TO GAME ABUNDANCE is not a simple one. It is not a matter of building larger state game farms from which more thousands of pheasants, quail, rabbits, grouse or ducks can be distributed for release, although restocking has a definite, but minor, place. It is not solely a question of appearing before state legislative committees or before Congress to urge the passage of new laws, although there are definite opportunities for new incentive legislation. It is not a question of protection (law enforcement), since this can be effective only if suitable habitat exists. It is not a problem of open and closed seasons, although proper seasons are of basic importance. The way to game abundance does not call for unrestricted destruction of predators—it may even call for encouragement of larger numbers of certain predators. Neither is artificial winter feeding, or duck food planting, or the establishment of refuges the single key which will unlock the door to abundance.

Game abundance is a function of suitable habitat—the greatest single thesis of this volume. All other management measures depend and impinge upon this one. With suitable habitat, many such measures can help produce abundance. Without suitable habitat, no other measures are of value.

Suitable habitat is a function of land. Its preservation, creation and improvement can be accomplished only in terms of land, and with the control of land. So long as game management remains a theory, or an ideal, apart from actual land management, it is of no effect. Only when we can and do get down to actual "dirt management"—land management—is there hope for increased abundance of game.

Land management for the increase of game abundance, in turn, comes down essentially to plant management, for the basic habitat pattern problem always must be faced and stated in terms of the necessary plants to which each species of game is racially adapted.

And, when we come to the actual attempt to control plant patterns for the purpose of creating new game abundance, the first of all essentials is

*Concluding chapter from *The Way to Game Abundance*, by Wallace B. Grange: Reprinted by permission of author and Charles Scribner's Sons, N. Y., Publishers.

an understanding of plants, and of the natural laws which govern their distribution, arrangement and successions. This volume has attempted to state some of these laws, their interrelationships with game species and the reasons why game abundance cannot be achieved, or even intelligently discussed, except in terms of plant succession laws. Every feature of the whole panorama of game increase or decrease inevitably, and without exception, traces back in some important detail to the nature of the plant covering and of the land area which this occupies. Even such apparently extraneous events as overhunting so trace back, for without the plant covering there is no hunting of any sort, while with adequate covering overhunting may actually be virtually eliminated.

I suppose some readers may finish reading this volume with a sense of disappointment since they perhaps expected to find within its pages definite prescriptions for abundance, such as one might take to the druggist for prompt filling in response to an exchange of currency or they may have supposed that there was some panacea by which their local game club could quickly change game scarcity to abundance. Unfortunately, no farmer has yet discovered a program by which he can grow corn or potatoes by such easy methods, or without hard toil upon the land with which he works. Successful farmers have learned, too, that they must work with their land, according to its characteristics and potentialities. And so it is with game management, for the growing of game crops is in reality a species of agricultural endeavor. It is a cultural process. Agriculture, silviculture, aquaculture, gameculture —these are the sciences by which useful plants and animals are produced as crops by man.

Individuals interested in game increase for their own benefit, or as a profession, or as a hobby, must first acquire the essential biological background which has been presented. With this knowledge, the next step is to think and act in specific terms, in relation to one or more definite parcels of land. There can be no better advice than to secure such land, by purchase, lease or simple agreement, and there attempt to apply the principles outlined. Here is a type of program available to almost any Izaak Walton League, Rod and Gun Club or similar group, and to individuals. The best educator is experience, the best teacher is the experience of *doing*. Game management—the attempt to produce or to increase a specific game crop—can be an exhilarating, stimulating, pleasant undertaking, and an educational one. The harvest of game by hunting is good recreation; it can be infinitely more interesting, more recreational, if the hunter himself has a hand in the production process. Public participation in the restoration and improvement of suitable game habitat is urgently needed. Every state game department has personnel which can be helpful, but no department can do the job unaided; or unless there is considerable public understanding of the reasons and necessity for this type of endeavor. The way to game abundance is the way of public understanding, public participation, in the actual management of land. I can think of no activity which a game club might sponsor which can equal in practical results and in educational value the definite launching of a game management project, under club auspices, upon a special tract of land dedicated to this purpose. The opportunity is almost unlimited. It exists everywhere; close to cities, in our most remote sections.

If we desire game abundance—if you desire it—a start must be made. We must not confine our efforts to the passage of resolutions deploring the commercial slaughter of ducks in Mexico, or demanding either longer or shorter open seasons, or to the pen production of pheasants—*it is necessary to draw our sights down to the practical level close at home, to select a specific land target and an objec-*

Ladino clover has proven itself a first class wildlife crop as well as a great soil improver. Rabbits, deer, and turkeys all make use of it as part of their diet. As its use increases in the South, wildlife will benefit accordingly.

One of the best friends the bobwhite quail has is the bicolor lespedeza with its heavy winter yield of seed. As new and improved strains of lespedeza appear, more and more of Virginia's colder areas will be able to winter quail successfully.

tive. The way to game abundance is not a journey to far off places; it is an adventure with land, plants and animals in our own locality. It offers a new form of recreation which can add immeasurably to the satisfactions of life.

This volume has stressed the importance of native vegetation. We have seen that every unit of native vegetation is in reality a fragment of wilderness. It is not amiss here to suggest that one of the largest of all conservation objectives is to insure the preservation of substantial examples of wilderness. We need to preserve intact and unspoiled, portions of the virgin wilderness, of the climax forests, of the native prairies, and many waters which can be kept as free as possible from civilized influences. These true, primeval wildernesses are a part of the American heritage of culture, of our standard of living, and we cannot sacrifice them heedlessly or needlessly without sustaining real loss. We need them as a source of inspiration, for the wilderness has always stimulated the thoughts of man and his spiritual development. The wilderness is a place in which man is helped to see himself in proper perspective as a part of nature.

But it is not alone the primeval wilderness we need. Closer home, we need the semi-wilderness, the commercial forest, the lake cottage in the woods, the farm woodlot, the fencerow thicket, the undrained marsh, the tiny pond and the sound of water tinkling over the beaver dam. The way to game abundance lies in preserving, creating, expanding the units of native vegetation which are, as we have seen, wilderness fragments. Their restoration can give us a more beautiful, more pleasant, more productive and more satisfying America.

Conservation is the science of man's successful living in relation to nature and her resources. We are not a thing apart, a species apart. Our habitat on earth includes the soil, the forest, the mountain, the farm, the predator and our game species. Man knows the technology of abundance if he will only apply it. Man can be wasteful, destructive, foolish, heedless of the consequences of his acts and so despoil his own habitat. Temporarily he can ignore erosion, uncontrolled forest fire, depletion of soil fertility, extermination of valuable species and unique plant patterns, pollution and the loss of his birthright as a creature of nature. But he can do this only so long. Eventually the penalties of habitat deterioration must be paid by the human species, as for every other animal species. The nature of man's own habitat dilemma requires another volume; suffice it to say that he is indeed confronted with such a dilemma almost parallel to that of the snowshoe rabbit population in a jack-pine thicket which has passed the optimum productive stage.

The way to game abundance is a start toward the realization that civilized man must now produce and manage the abundance which contributes to his standard of living. In America we are very fortunate. We have the opportunity, the resources, the technology for abundance of almost any sort, if we choose to apply ourselves to the task.

If we desire to maintain recreational hunting, for example, we can do so. The creation of game abundance is in our own hands, the way to game abundance is in our own doing.

★ ★ ★ ★

COMING NEXT MONTH

FOR A HEALTHY VACATION

By Lonsdale J. Roper, M.D.

State Health Commissioner

IN THE PATH OF THE RED DEMON

By E. E. RODGER
Chief, Information, Virginia Forest Service

Each year, thousands of acres of Virginia's wildlife-producing forests are destroyed by the raging fury of the "red demon." The sad part of it is that over 90 per cent of the loss is avoidable.

"SMOKE BOILING UP two miles east of Beaver Creek near Jack Benson's place! With this wind and the heavy laps from the logging operation, looks like you're going to have a tough one to handle!" This sort of call from a forest fire lookout tower to a forest warden is much too frequent.

Wild fires sweeping through the woodlots and forests of Virginia destroy more than the leaves on the surface.

An "old-timer" down on the peninsula a short time ago was discussing the new products being made from cellulose obtained from trees. He mentioned a product made from layers of paper, "glued" together with resin under tremendous pressure. The finished product is half as heavy as aluminum and as strong as steel. In spite of the "old-timer's" knowledge of forest products he still had the mistaken idea that many people have—the thought that fire chases out the snakes and rids the area of insects.

It is a proven fact that there is more insect activity around dead organic material than there is around healthy growing vegetation.

Forest fires do not kill as many insects as one might be led to believe. Granted, the slow-moving insects may have difficulty avoiding an onrushing fire, but they seem to return in even greater hoards following a fire. The old theory—"burn the forests to destroy chiggers, ticks, cotton boll weevils and snakes" has been disproven by leading entomologists and agriculturists as well as by foresters. Therefore, another approach to the insect problem is necessary and fire should be kept out of the forests.

Fire, besides killing the trees, often burns away the humus and minerals needed for good tree growth. Some forest soils are so largely humus, and fires so destructive of the fibrous content, that all the remaining top soil is washed away by rain.

Destruction tallied against forest fires also includes the harmful effects it has on wildlife. Springtime is nesting time for the animal life of the forests. Young deer, rabbits, quail, turkey and grouse have little chance of escaping an onrushing fire. The number of nests destroyed is impossible to measure, but population counts in fire scarred areas, show a definite decrease.

April 20th brought forth one of the largest armies of fishermen on record. Most of the fishermen were sportsmen but, unfortunately, there were a few "fish hogs" along the streams. A "fish hog" is irresponsible—he takes more than his share of fish or game and is careless with fire. On the other hand, a sportsman carefully drowns his warming fire and obeys the creel limit. The "fish hog" is the person, man or woman, that spoils the watershed of the trout stream by turning it from a lush green forest into a blackened waste.

Fish cannot live in a stream muddied with ashes washed into it from fire ravaged forest land. The lye found in the ashes kills the young fish and destroys much of the plant food found in the streams and lakes. The balance of nature is upset by man's carelessness.

In the Bible, Psalms 104:16-17, is found the following passage: "The trees of the Lord are full of sap; the cedars of Lebanon, which he hath planted; Where the birds make their nests; as for the stork, the fir trees are her house." Another passage from Joel 1:18-19: "How do the beast groan! The herds of cattle are perplexed, because they have no pasture; yea, the flocks of sheep are made desolate. O Lord, to Thee will I cry; for the fire hath devoured the pastures of the wilderness, and the flame hath burned all the trees of the field." Man was told 3000 years ago of the home of the wild creatures and also told of the damage done by fire. The great cedar forests of Lebanon are no more, the land is arid and eroded—a sample of man's destruction.

The forests of Virginia, 15,000,000 acres, are vital to the welfare of the Commonwealth. They provide the raw materials for countless products needed in modern living, they keep the second largest industry in operation, they provide a home for wildlife, a place for tourists and natives to relax and they assist in the conservation of our most vital resource, water.

Virginia is, indeed, fortunate that very few fires are a direct result of lightning bolts, in fact, only 1% of the 2,084 fires during 1950 were caused by lightning. The remaining 99% were a direct result of thoughtlessness on the part of man.

Thoughtless people can be educated in fire prevention. It is a difficult uphill task—but worth the effort. Constant reminding is necessary for people do, unintentionally, perform careless acts.

Careless smokers were responsible for over 38%

(*Continued on page* 23)

The Scientific Side

Controlling Diseases in the Wild Turkey

By DENNIS HART
Manager, State Game Farm

(Photos by Kesteloo)

WE HAVE COME TO regard hunting as a harvest of the annual crop of game, and we are particularly justified in taking this harvest when, by our management efforts, we have materially increased the crop. In connection with our management and harvesting, though, we become aware of the fact that there are other factors tending to take some of the crop and to thereby diminish the numbers left for us.

The crop, insofar as the harvest is concerned, is not exclusively the young of the recent rearing season but is rather that portion of the total population that is excessive on the area in question. Between the end of one rearing season in the autumn and the beginning of another in the spring, there is a normal decimation or harvest of game bird populations in which Mother Nature, even more importantly than man, participates. Nature's purpose is to remove the least adapted individuals prior to the next rearing season. She has several tools for the accomplishment of her purpose. In a general way these tools are hunger, exposure, disease, and predation. Actually, man may be classed as one of the predators.

Man's conscious purpose in taking game is for food and for recreation, and in order that he may have more food and better recreation he gives a considerable amount of attention to curtailing Mother Nature's harvest. The fewer birds that die of hunger, exposure, disease, and predation, the more there will be available for man to harvest with dog and gun. Our concern here is to review something of what we are up against in minimizing Nature's harvest of game, particularly via disease in wild turkeys. Actually hunger, exposure, predation and the other factors are closely interrelated with the disease factor.

Disease, by definition, is disturbed or abnormal physiological action in any living thing. Its cause may be infection, infestation, injury, malnutrition, or constitutional abnormality. The first two, and similar causes, are the most important from the management viewpoint. Infection and infestation are terms used to indicate the presence of very small, often nearly invisible forms of life in or upon a larger form of life, with harmful effects upon the latter, called the "host." Lice upon, or round worms within, the wild turkey would be examples. The harm results from the disease causing organism feeding upon the tissues or blood of the host, or feeding upon the contents of its intestines and stomach, or in giving off waste products which are toxic to the host, or in other similar ways. Lice,

The author examines a game-farm-raised wild turkey at Cumberland for signs of illness. Raising wild turkeys in captivity calls for a never ending vigil against disease.

Cleanliness is one of the most important factors in controlling disease at the game farm. Turkeys are raised on wire and off the ground, which greatly lessens chances of infection.

mites, round worms and tapeworms are common examples of the visible small life forms which infest turkeys. Then there are innumerable varieties of bacteria (small plants) and protozoa (small or one-celled animals) which can be seen only by the aid of powerful microscopes. Not all of the bacteria and protozoa are harmful to the host as some of these have beneficial effects upon the larger species in which they live. Some of the bacteria, for example, aid in breaking down foods in the intestines so that the nutrients can be assimilated into the blood stream for body building. Other forms are wholly detrimental. Still other kinds of disease agencies are too small to be seen with the aid of any human device, but are known to be living because evidence shows them to have the common physiological functions of living things—they reproduce and multiply, for example. These are the viruses.

All living things are constantly attacked by these parasitic or disease-producing organisms. In turn, they endeavor to repel and kill and cast them off. All life is a never ending battle between disease organisms and the hosts in or upon which they must dwell if they are to survive. As we can see by the fact of species survival, Nature maintains a rather fine balance between the powers of attack and the powers of repulsion. Our purpose in the present instance is to take sides with the wild turkey so as to free it in a measure from the onslaughts of disease, minimize the mortality therefrom, and so have more turkeys for the sport of hunting.

It is important to realize that sickness and mortality are not caused merely by the presence of disease organisms, but rather by their presence in such large numbers that they overwhelm the natural coping powers of the bird's physiology. In other words, there are two basic and interrelated factors to disease: (1) the strength of the invading organisms (dosage strength) and (2) the host's physiological ability to repel and counteract.

In Nature, there is almost always a nice balance between the two factors. As soon as a turkey population begins to reach higher than normal concentrations, disease organisms find it particularly easy to pass from one to another of the turkeys and to build up great population reservoirs in the areas frequented by the turkeys. Accordingly, such heavy dosages are ingested or otherwise received by the turkeys that their physiological powers are overwhelmed and epidemic results. The next result is that the parasites have parasitized themselves out of house and home, so to speak, by killing off sizable proportions of the host species. Thus, disease organism concentrations are minimized and the host species is free again to rebuild toward normal population numbers. In some game species, population fluctuations caused by disease are characterized by short and irregular ups and downs. In other species, the decimation occurs over the space of two or three years, followed by a re-building trend lasting for roughly six or seven years. These species are designated as being cyclic in population behavior.

Basically, man's efforts to control disease in wild turkeys must conform to natural principles. But while Nature's final check on disease is by dilution of dosage—by thinning out of the host populations—we want to accomplish the same effect by other means that will allow us to maintain large turkey populations for hunting.

Game management calls first for the rebuilding of soil fertility. Wildlife cannot be healthy and strong and resistant unless well nourished by the ingredients derived from the seeds and fruits and insects available to it as feed. These things, in turn, cannot nourish well unless the mineral elements, including trace elements, are present in normal balance in the soil. There need to be types of land use that will provide succulence, fruits, and insects in abundance, with a good carry-over of numerous kinds of hard seeds for winter consumption.

Habitat types, as feeding areas, escape cover, nesting sites, etc., should be developed as adjacent or interedged strips so that they can be utilized by wildlife of the area in general without inducing abnormal concentrations of turkeys, for example, at certain restricted locations. In times past, artificial

feeding shelters and planted feed patches were much in vogue. Today, wildlife borders are serving game much more effectively and safely.

Biologically sound management calls not so much for predator control as for development of patterns of habitat type interrelations that will enable healthy turkeys to, for the most part, escape predators. In any wildlife population, there are some members which are below par. The reasons are inherent abnormality, disease after-effects, injury, etc. Often these birds are either carriers of disease or are abnormally susceptible to disease, and as such they are a tag-along threat to the rest of their group. It is a distinct benefit, therefore, for predators to be on hand to snatch up these members who through weakness are unable to utilize the escape avenues provided by normally good cover. Habitat improvement takes precedence over predator control as the game manager's disease control tool.

Disease control in captivity is based on the same general principles as apply in management in the wild. The difference is mainly in manner and intensity of application. Every effort should be made, of course, to produce normally developed and disease free stock for release so as not to introduce concentrations of disease into the native flocks. Range rearing of domestic turkeys ought to be discouraged in areas where the native wild turkey can be preserved or re-established. The domestic strains spread diseases and parasites to the native stock, and, too, inter-breeding of the strains may result. This last, if practised for only one season will for several generations be evident in lowered gameness and vitality in the wild stock.

Holding game farm turkeys in pens for several days before releasing them in the wild allows them to acclimate themselves to the area, and cuts down mortality.

At the State Game Farm, all turkey poults are reared off the ground. Both the brooders and growing pens have wire floor exercise runs in preference to ground range. This allows us to minimize contact with disease organisms. Only the breeding stock, during the four months' breeding season, is allowed on the ground. This is necessary, since we utilize native wild toms for mating with our captive wild hens. Fifteen to eighteen hens are wing clipped and confined in acre-size woodland pens. Native toms enter and mate with them, thus insuring the production of the genuine wild strain for restocking. Rigid sanitation is maintained in those pens and about the feeders and waterers, and preventive doses of worm expellants are given periodically. During the non-breeding season, the stock is carefully selected in order to have only well developed and disease free individuals for breeding purposes.

Egg production is a heavy drain on breeding stock and the extent to which health can be maintained depends largely upon the quality of the feed and the extent to which birds are protected from the necessity of fighting invading disease organisms. Lice, mites, intestinal worms, blackhead organisms, or whatnot, all must be resisted as they drain off physiological energy and strength and vitality that otherwise could be applied to egg production. Not only number of eggs but also quality is involved. For example, reputable feed companies compound feeds that are adequate in all the nutritive elements, but when turkey breeders are heavily infested with round worms the latter use up so much of the turkey's supply of vitamin A as to create a deficiency. As a result, the bird's resistance to disease is lowered and the eggs are deficient, too, in this essential element. As a further result, many of the eggs cannot hatch and many of the poults which are hatched cannot live for long, regardless of how well cared for in the brooders.

Naturalness of management methods, whether with regard to range populations or captive stock, is always conducive to quality. For this reason, we avoid the popular tendency to dope our turkeys with antiseptics and medicines excepting where necessary to curtail the greater evil of actual mortality from disease. Antiseptics in drinking water, lime in litter (to retard mold) and similar practices can cause digestive and assimilative disturbances that will have an opposite of intended net result. Drugs are no substitute for sanitation.

Disease mortality can be minimized by working in harmony with Nature. Man can help Mother Nature accomplish her purpose while he is by the same means augmenting his own turkey shooting.

VIRGINIA WILDLIFE

CONSERVATIONGRAM

Late Wildlife News . . . At A Glance

THE FOURTH ANNUAL Wildlife Essay Contest conducted in the schools of Virginia by the Game Commission in conjunction with the Virginia Division of the Izaak Walton League of America was an outstanding achievement in the field of conservation education in the opinion of prominent authorities in the state. The quality of the essays has increased with each contest, and this year's winners displayed an understanding and knowledge of the subject that was exceptional.

Thousands of entries were received at the Commission offices in Richmond, and judging was extremely difficult. $960 in cash prizes were awarded to 56 prize winners throughout the state. In addition, school prizes of $20 each went to Beaverdam School in Hanover County and Wylliesburg School in Charlotte County.

200 Certificates of Merit were also awarded in the contest. A complete list of Certificate Winners can be found on page 27.

Eight $50 first prize winners were brought to Richmond as guests of the Commission, and received their awards from Governor Battle in ceremonies at the State Capitol.

Following the ceremonies a guided tour of Richmond was arranged for the winners, followed by a luncheon at Hotel Rueger and a showing of the Commission's film "Operations Wildlife."

A complete listing of the prize-winners follows:

***Grand Prize Winners* ($50): 12th grade, Larry Twiford, Occoquon District High, Prince William County; 11th grade, Dae Reynolds, Hardin-Reynolds Memorial High, Patrick County; 10th grade, Dot Carwile (third-time winner), Bedford High, Bedford County; 9th grade, Donald Thayer, Cleveland High, Washington County; 8th grade, Sue Ellen Henderson, Jeter Junior High, Alleghany County; 7th grade, Betty Ference, Disputanta High, Prince George County; 6th grade, Floyd Matthews, Beaverdam School, Hanover County; 5th grade, Marion Davis, Simonsdale School, Norfolk County.**

***Second prize winners* ($25): 12th grade, Alta Lee Sexton, Elk Creek High, Grayson County; 11th grade, James Allen Barbee, John Marshall High, Richmond City; 10th grade, Barbara Hawkins, Culpeper County High; 9th grade, Carolyn Scheele, Stratford Junior High, Arlington County; 8th grade, Joyce Wakeman, James Monroe High, Spotsylvania; 7th grade, Barbara Mae Riley, Concord School, Campbell County; 6th grade, Nancy Kate Givens, Newport High, Giles County; 5th grade, Melinda Kendrick, Huddleston High, Bedford County.**

***Third prize winners* ($15): 12th grade, Chris Alexander, Farmville High, Prince Edward County; 11th grade, Virginia Aylor, Madison High, Madison County; 10th grade, Carrie E. Walker, Albemarle Training School, Albemarle County; 9th grade, Patricia Myer, Toano High, James City County; 8th grade, Betty Ramsey, Big Island High, Bedford County; 7th grade, Kinsey Bass Green, Powhatan High, Powhatan County; 6th grade, Tommy Huseby, Dunn Loring School, Fairfax County; 5th grade, Mary Ellen Spencer, Francis Asbury School, Elizabeth City County.**

***Ten-dollar awards went to:* 12th grade, Jack Royall, Poquoson High, York County, and Page Crute, Central High, Buckingham County; 11th grade, Nancy Ketron, Lebanon High, Russell County, and Calvin Lloyd Hazelwood, Toano High, James City County; 10th grade, Floyd White, Jr., Warren County High, and Jackie Stone, Victoria High, Lunenburg County; 9th grade, Marilyn McClung, Kempsville High, Princess Anne County, and Shirley Foster, Eggleston High, Giles County; 8th grade, Betty Thompson, Kenbridge High, Lunenburg County, and Helen Turner, Warrenton High, Fauquier County; 7th grade, Dick Young, Colonial Heights School, Chesterfield County, and James Drewry, Emporia Elementary, Greensville County; 6th grade, Billy Bennett, Bennett School, Prince William County, and Frances Lenhart, Chase City High, Mecklenburg County; 5th grade, Connie Mason, Keysville School, Charlotte County, and Calvin DeVese Hughes, Boonsboro School, Campbell County.**

***Five-dollar winners were:* 12th grade, Barbara Trenary, James Wood High, Frederick County, and Frankie Tatum, Hardin-Reynolds Memorial High, Patrick County; 11th grade, Bernell Hawks, Lamsburg High, Carroll County, and Bernice Thacker, Wise High, Wise County; 10th grade, Betty Jean Garwood, Greenwood High, Nelson County, and Yvonne Jones, Appalachia High, Wise County; 9th grade, Martha Adams, Battlefield Park High, Hanover County, and Judith Ramsey, Chase City High, Mecklenburg County; 8th grade, Loretta Vest, Lee Junior High, Roanoke County, and Dale Starnes, Fort Blackmore Junior High, Scott County; 7th grade, Bobby Odom, James Monroe High, Norfolk City, and Jane Norman, Purcellville Grade School, Loudoun County; 6th grade, Janet McDonald, Axton High, Henry County, and Barbara Foster, Wylliesburg School, Charlotte County; 5th grade, Boyd Bunting, Botetourt High, Gloucester County, and David Driver, Jefferson Grammar School, Augusta County.**

Commission personnel and Izaak Walton League officials are already arranging details for next year's contest.

New Smallmouth Hatchery

Out in the hills of Smyth County, the Commission's new smallmouth bass hatchery has at last become a reality. With its completion, the Commission has doubled its capacity for production of fighting bronzebacks.

Here, in pictures, are portrayed a few views of the new hatchery during the construction period.

(Photos by Kesteloo)

A high oxygen content in the water is important in the raising of hatchery fish. Fresh water constantly flowing in assures this.

Each pond constructed called for a lot of hard labor and a large amount of material. Note the cement that will go into this spillway.

The first pond is finished and when full will receive its fish. This water has a capacity of about 300 pairs of breeding bass.

Water for a number of smaller ponds at the hatchery will be controlled by the series of valves shown in the picture below.

Construction of the raceways for channeling off water is another step towards completion of the project.

Thousands of man-hours went into the building of the new fish producing plant. Here a construction crew pours concrete for a spillway.

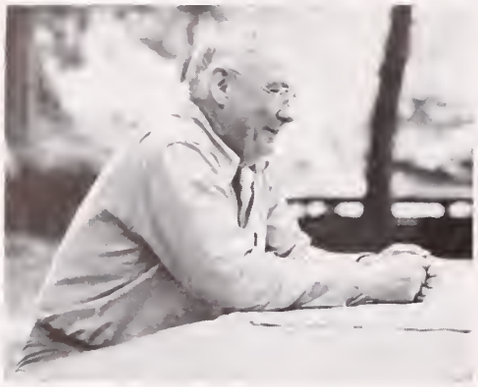
The diversion dam above directs the fresh water of the river into pipes for delivery to the hatchery ponds.

The dam of the first pond forms a part of the bank of the second. Bottom of the second pond is in the foreground.

A long range view shows the series of pipes through which fresh water is fed into the ponds over a wide area.

This concrete spillway will soon form part of the dam for another breeding pond in the new hatchery.

An overall view of the spillway and raceway gives some idea of the size of the holding and breeding ponds for the smallmouths.



"Cap'n Bill" Vinal

Outdoor Education In Reality

By WILLIAM GOULD VINAL, "CAP'N BILL"
Professor of Nature Education,
University of Massachusetts

MANY THINGS are called "reality." A geranium in the desert air of a school room is "reality." A teacher attempting to feed a house fly to a herb-eating tadpole in a jar of water is "reality." Driving hundreds of boys and girls, potentially useful citizens, to escape from memorizing biological facts in a textbook is a "reality." After 43 years of teaching, the writer (he hopes) has a greater understanding of nature education, its frailties and its strength.

Indoor realities and outdoor realities are different in values. A few generations ago farm chores, the old swimming hole, and the trap line served reasonably well as outdoor "realities." When our grandparents finished the farm-home curriculum, plus the "3 R's" in the little red school house, they took their place in life with security. The neighborhood and town meeting presented few problems.

There are signs that schools, outdoor and in, are not doing all they might to fit the youth of today for life. The schools have not caught up with new scientific knowledge about the natural world. We can scarcely expect a new voter to be equipped to make a wise decision on such matters as wildlife, conservation, parks and sanctuaries, pollution, and contour plowing.

Some fine morning step out of doors and look for nature "realities." This means *really* look. Who owns the street trees? To whom does the population of singing birds belong? To whom do the waterfowl and the fish belong? In America, they are *yours*. The things you see and think about and plan and *do* are more important than you realize.

The items just mentioned are common to all communities. They are needs which should be recognized everywhere. People with varying religious and racial backgrounds can work together as a group to find peaceful solutions for these problems. Russia also has her scientists, natural resources, outdoor open spaces, and schools. Too few of us have a clear idea of the difference between American democracy and Soviet communism. In Russia the scientists, the playgrounds, the houses, the people and the schools belong to the state, and serve the state. Here, the playgrounds and schools, birds and fish, belong to the people in order to serve the people. Even children have the freedom to observe, to speak, to plan, to recommend. All of us are trustees of the land, the forests, the birds, and the fish. We have the moral obligation to pass them on in as good condition (or better) as we received them. We educators have failed to teach our children the fundamentals of conservation on the American plan.

Rights have to be won by each generation. We do not, in "reality," understand the problem of rights as read in the Declaration of Independence. The boys, in Revolutionary days, wanted to slide down hill on Boston Common. The British soldiers stood in their way. They went to General Gage

with indignation. He smiled at the audacity of these young whippersnappers. He gave them their inborn rights.

Today children have the right to swim in clean water. They have the right to slide down hill in safe places, to skate, to boat, to fish, to hike, and to camp. These are things worth fighting for. It calls for team work. This is not a matter of recalling facts for an examination. It is learning the precepts of democracy by doing, by practice. Youth must be taught the value of individual freedom and a system that permits unlimited growth. There is still need for ambassadors of good will which is a part of the American ideal.

Walk a little farther. How far do you have to go to see the results of the careless use of soil, water, or timber? How many acres of formerly cultivated farm land have been completely locked up for all time against cultivation? Was this done by a realty subdivision, erosion, flooding, a water company, a sand and gravel company, or just how? Is there any place where new farm land can be added to offset the "old land" that has gone forever? Maybe you will pass a playground, or a park. Did someone cut down the trees to make the playground and then start planting trees again to make the area look beautiful? If you walk far enough would you come to a tract that was set aside for a community forest? Did these facilities come about by communism or by democracy? Was it accomplished by and for the people, or by and for the government? If you cannot answer these questions, clearly there is something the matter.

The right to be out of doors, to enjoy nature, to walk a mountain trail and revel in the view—these rights belong to all of us.

Where is the nearest tract of land where volunteers have banded together and purchased in order to conserve natural resources? If you have to walk to the next town, or the next state, to find such an area what do you conclude?

Keep on *really* looking. Keep on questioning. What local industries deal directly with the products of soil, timber, or water? How are they practicing conservation of these natural resources? Are they polluting streams with industrial waste or have they installed waste-disposal plants? Does your neighborhood have garden spaces? Play spaces? A wilderness area? A primeval forest? Is conservation necessary in your community? Whose business is it? How many of the citizens will suffer if it is not practiced? Is all this theory? If the teacher and the children should spend a week (even when walking to and from school) answering these questions, would it make a good town meeting (assembly)?

Too few realize that the Kremlin has no intention of living in peace with democracy. Too few men in the service know why they are fighting in Korea. Too many are surprised to know that Chinese can be strong, that they have brains, that they have natural resources, and loyalties. Too soon they used the term "Gooks." Most of all, we need to restore faith in America and its principles. We must do this first in the small community. There must be a will for new community efforts.

The greatest single experience today in an American school is to husband our natural resources and to bestow on every citizen the freedom to see, to plan, and to create. Conservation and democracy fall together into one neat package. Every teacher must recognize the need of space, trees, clean water, wildlife, and human resource as the first responsibility. The science teacher (biology means the study of life) should take a live interest in community affairs about life. The football coach can encourage teamwork to wrestle with tough problems. The English teacher can find here a climate for orderly thinking. The history teacher is first of all a citizen. This is one occasion when the entire school can turn to the problem of the day. Personal-social needs become the point of departure for the curric-

(*Continued on page* 24)

Those Scrappy • • •

SMALLMOUTHS

By HUGH O'NEILL

THE DUN-COLORED FLY hung suspended in the light breeze for just a moment, then dropped softly and effortlessly upon the surface of the upper Rappahannock. It rode there for a few seconds, bobbing and dancing in the swift current, before moving off down the river in the general direction of Fredericksburg, many miles below. Suddenly the water exploded in a boiling torrent of spray and with a savage swirling rush the fly was swept from the surface. I found myself tied to three pounds of fighting fury.

From there on the action was fast and spectacular! The smallmouth fought with a succession of savage rushes and plunges, and an occasional leap that threw silvery droplets of spray in every direction! The taut line cut sharp zig-zag patterns in the river with each twist and turn of the fighting fish, and the flyrod bent in an arc and vibrated madly with the strain. When finally, after several minutes of fierce resistance I was able to scoop the bronzeback from the water, I knew that I had met one of the gamest fighters in the finny kingdom, old *Micropterus dolomieu* as the scientists call him, Mr. Smallmouth Bass!

(Photo by Kestcloo)

Bass fishing, both for largemouths and smallmouths, is certainly a major part of the Virginia angling picture, but because the largemouth enjoys wider distribution throughout the state and grows to a larger size than the smallmouth, the latter has been too long neglected by many of the Old Dominion's fishermen.

Actually, even though the largemouth does achieve a greater size, from the sportsman's point of view he can't compare with the smallmouth. Filled with a fighting spirit and a courage that won't quit, the smallmouth will dance and jump and fight the fisherman right to the last moment, and even when boated he will still make frantic attempts to escape.

In Virginia, the smallmouth bass are reared at the hatchery at Front Royal and at the new plant at Marion, in Smyth County, which has just gone into operation. The addition of the new hatchery will give the Commission facilities for producing an estimated 100 tons of bass each year for stocking in the waters of the Old Dominion.

Hatchery work with bass is an art in itself and in many ways is a far more difficult and arduous task than propagating trout. For one thing trout are so constructed physically that they can be stripped of their eggs and hatching and raising of the young fish can be carried out in trays at the hatchery. With bass this is not the case, since the eggs cannot be stripped from the female fish. Natural spawning is the only method by which bass can be propagated. Because of this a much larger physical plant is needed for a bass hatchery than for a trout hatchery. Breeding ponds and holding ponds take up a much larger acreage than do trout rearing pools.

In addition to the spawning difficulties, bass offer many other headaches to the hatchery men. Smallmouth bass are among the most difficult fish to raise in captivity for other reasons: they cannot be grown under as congested conditions as can many of the other species of game fish in captivity; they are very susceptible to many types of parasites, both internal and external; the irregularity of growth

results in cannibalism unless they are kept segregated as to size, and if the water temperature is materially lowered from a normal temperature during either the period of incubation or the yolk-sac stage, they die.

At the Commission's hatcheries selective breeding is strictly adhered to. The brood stocks are selected from individual fish showing the greatest growth.

The smallmouth bass are spring spawners and spawn when the water has reached a temperature from 60 to 70 degrees Fahrenheit. The male selects the site for the nest in a depth of 2 to 4 feet of water and usually adjacent to a log or rock so that one side is protected. They cleanly sweep out a basin in the sand and gravel, making a rather elaborate nest. It is rarely that two bass prepare their nests in close proximity, and for this reason many brood bass cannot be placed in a hatchery spawning pond if the best results are to be achieved. After the nest is prepared the female is attracted and the spawning takes place. While the female is depositing the eggs the male works in contact, fertilizing the eggs by depositing milt. After spawning, the female deserts the nest and the male stays on constant guard, keeping the eggs free from all foreign matter by working the tail and fins over the nest, and guarding it against enemies.

The James is not only a river of history—it's a fisherman's river as well! Here a Virginia angler tries one of the best smallmouth spots.

Photo by Shomon

The natural hatching time of the bass egg in a water temperature of from 60 to 70 degrees Fahrenheit is from 7 to 10 days. Immediately following the yolk-sac stage the young bass leave the nest in a school in search of food which consists of daphnia, or tiny water fleas. During the school stage the male bass guards and protects the young against enemies. It is observed that when a supposed enemy approaches a school the old bass will swim through the school, breaking it up so that they cannot be so readily detected. The school breaks up in from 4 to 5 days, and shortly thereafter the parent has no regard for the family and will devour its own offspring. Due to the irregular growth of the bass, cannibalism starts among the young fish within a few days after the school has broken up. For this reason the young bass are removed as soon as practicable and placed in concrete ponds where they are held and cared for until they have obtained a sufficient size for releasing in suitable waters of the state. By the end of the year the bass have reached a length of from 2 to 8 inches and are eating insects and the fry of smaller fish. It is the end of the second year before most of them have reached the 8 to 12 inch range, at which time the majority of them have matured sufficiently for spawning.

That's when the hatchery trucks start rolling out to the famous smallmouth waters of the state. Out to the Shenandoah, the lovely daughter of the stars; to the Rappahannock, to the Holston, to the upper reaches of the James, and to scores of other fast flowing cold water streams of Virginia where the smallmouths will thrive and prosper and will offer a challenge to the eager fisherman. And the nice part about it is that the fisherman doesn't have to be an expert to catch bass, either! All he has to do is to be in the right place at the right time and drop the fish something appealing for bait. Mr. Bass will do the rest! A nice active minnow, a good kicking frog, or a nice crawling crayfish are all good in the live bait line, and for the man who likes artificial lures there are scores of plugs on the market that will bring the big ones out of their hiding places with a savage rush, not to mention an infinite number of bass flies and bugs that produce for the flyrod users.

No matter what kind of bait or tackle you use, however, once one of these finny battlers has taken the hook you've got a real fight on your hands.

"Inch for inch and pound for pound, the gamest fish that swims," has often been said of the scrappy smallmouth. He certainly deserves the tribute!

Silhouetted perfectly against the gray sky, the dreadful form stood motionless. This was the supreme moment for the grouse. It was too late to flush!

TERROR

IN THE MOONLIGHT

By J. J. SHOMON

THE SITTING GROUSE was aware that nesting time meant danger. The fallen oak beside her was partly submerged in the beaver pond but the upper trunk nearest the stump was on high ground and with the laurel bushes seemed to afford a measure of protection. What worried the grouse was not the water. This only harbored brook trout and a family of beaver and these were harmless. The big menace came from prowling creatures at night who came to the pond searching for things to eat. The grouse knew that every minute of her incubation on the ground beneath the laurels would be spent in the shadows of death. It was an ordeal —twenty-three days of it—and now her twelve eggs were about to hatch. The sun had long disappeared over the ridge and the tall hemlocks beside the creek below the beaver pond seemed to close in with the darkness. It was from this direction that the sound came, a muffled coughing kind of a sound that sent a cold chill through the grouse. The noise was low and was almost absorbed by the gurgling water as it pushed through the beaver dam. Then it came again, a little louder . . . *ket-too* . . . *k,k,ket-too!*

Short, stiff feathers rose to a sharp crest on the head of the grouse and her neck lengthened. She was sure the sound came from an unwelcome guest and that it must be near. The water of the pond was only six feet from her and the beaver dam scarcely ten yards beyond. The peculiar coughing sound came from below the dam near the hemlocks and these were close enough to cast dark shadows over her during the moonlight.

This was the first time the ruffed grouse chose to nest in the cove between the mountain ridges and so close to water and it was the very first time in her life that she was unusually alarmed. The upper ridges held their dangers too, but this was different This was an ominous, somewhat sinister sound in the moonlight and she did not like it.

The noise stopped, only to be followed by foreboding quiet. The grouse sat trembling beneath the laurel branch and stared wide-eyed into the shadowy space in the direction of the hemlocks. A warm night breeze came over the trees and across the pond faint ripples began to make their appearance. It was good to hear once more the lapping of the water against the log and to feel the cool air filtering across her back. The fallen log, a shedding old oak that had been pushed down by a storm the previous year, was only two feet away and held affectionate memories for her. This was the log upon which her mate had drummed so often and so picturesquely in the days when the dogwoods and redbuds spread their patches of white and pink throughout the cove. It was really her log of love. No wonder she chose to make her nest beside it and here to hatch her young.

Rising higher over the ridge the golden moon brightened the pond like a gentle searchlight, casting an ash-gray glow over both wood and water. Peeled sticks of aspen on the beaver dam stood out with almost phosphorescent luster and the water licking against the driftwood sparkled. It was an eerie night. Not a thing stirred and except for the earlier coughing from the hemlocks and the gentle action of the breeze through the trees there was no sound. The family of beaver farther up the pond had not yet started their nocturnal work: felling aspens, gnawing and dragging limbs, and slapping

the water with their tails. Something was surely holding them up, something disquieting even for beaver.

As the moon rose higher in the heavens the surrounding shadows shortened but the big hemlocks still cast columns of darkness over the grouse. The dam was perfectly visible now, clear in every detail. Suddenly out of nowhere a huge sinuous creature slithered onto the beaver dam and began poking around the gleaming sticks. The grouse spotted it instantly. It was a slick, furred beast full of nervous motion. Sniffing the air high, it swung its nose back and forth like a wild goose as if trying to detect the presence of food, then yanked in its long neck and coughed.

It was the first time the grouse had seen an otter but her protective sense warned her immediately that it spelled danger. She could tell by the way the thing was acting that it was dangerously hungry and that unless a miracle happened it might be upon her any moment. Her leg muscles stiffened and she shifted her weight forward ready for the quick flash into space. But she must not leave her eggs now, not until the last possible second.

Why don't you watch where you're going?

The otter did not stay long on the dam but began sniffing around the driftwood, investigating one hole, then another, finally disappearing into the water. A trail of air bubbles rose to the pond's surface where the otter submerged and the grouse could follow its progress underwater by the bubbles alone. As long as the otter kept its hunting close to the dam, the grouse felt momentarily relieved, but what if the hungry beast should suddenly turn its search in the direction of the sunken log? The grouse kept her eyes watchfully on the water and hoped the otter would find a fish. At this moment, farther up the pond where the shallow beaver pond narrowed into a creek, there came the first SLAP of a beaver. The forest engineers had begun their work. It was a welcome sound.

What would happen if the otter and one of the beaver might unexpectedly meet in the pond, the grouse did not know, nor did she really care much. Her big worry was only the otter. Would it surface . . . and where? What happened to the bubble trail? Luckily for the grouse, however, the otter broke water on the far side of the dam and holding a quivering trout in its jaws, leaped upon a peeled aspen log. It was a weird sight, this picture of the otter ravenously eating its fish in the moonlight, and the grouse shivered at the thought of what might happen if she was selected as the next victim. She wished it would get its fill and move away to other hunting grounds; all would be well again. But there was faint hope of this. Something else had heard the commotion in the water and was stealing down through the laurels behind the grouse to investigate.

The grouse stiffened her feathers and listened. The new sound was soft but betrayed a stealthy movement over dry leaves. Consternation passed through the nesting grouse. If she turned to face the sudden danger at her back it might create a stir and this would surely give her away. Then again what about the otter. Her safest move was to be positively still, to try to escape detection. Dark shadows still covered her and she was remakably inconspicuous beneath the laurel branch. She had a clear get-a-way in front and out across the pond into the ridge beyond. But she could not leave now; there was life in the eggs and they might hatch any time soon.

The otter finished eating the trout and was off again in the pond. The grouse watched the air bubbles making straight for her sunken log, her eyes quickly opening wide in terror. A small twig broke under the pressure of padded feet behind her, scarcely ten feet away. It was by the stump next to the log.

Panic seized the grouse. A wave of shock raced through her insides. This was beyond all endurance. A hungry monster coming her way by water and another terrible creature at her back. There was silence for a brief second, then something heavy leaped upon the drumming log. The grouse could tell from the sound of the leap that it must be a powerful beast, possibly even larger than the otter. Out of her right eye she could faintly make out the hulk of an enormous animal moving slowly down the log beside her.

There was only one escape—flight. But the eggs, they were hard to leave and her mother instinct was strong. She would wait a second longer. Maybe the enemy would turn back, change its mind, maybe it would jump off the log to the right and continue its way along the beaver pond. Maybe her friends,

the beaver, would fell a tree and the crash might scare both intruders away. But this was no time for such hope. This was face to face with death. Only the swiftest action would save her from disaster.

The top of the oak log was thirty inches from the nesting grouse and its rough surface was clearly outlined against the moonlit sky. The grouse watched with mounting horror. Then the terror on the drumming log became more distinct, a tremendous ball of fur and muscle moving down in a crouch along the drumming log. Half way down, just opposite the grouse, the enormous lynx stopped, its rapier-like claws sinking deep into the bark. Silhouetted perfectly against the gray sky, the dreadful form stood motionless. The grouse felt faint. This was the supreme moment. It was too late to flush. The lynx was suspicious and twitched its bobbed tail nervously, then turned its savage head straight towards the grouse. This was it! The grouse could stand it no more and sent a charge of energy through her powerful wings intent on bursting into the animal's face. But to her astonishment she couldn't move! Every tendon in her body was paralyzed beyond control. Her only sensation was the pounding of a frantic heart within her breast.

Again the grouse tried to charge but she was helpless—completely at the mercy of the killer! The big cat blinked its orange eyes, gave a faint, almost inaudible snarl, then lifted its head and contined slowly down the log to the water.

Whether the lynx was partially blind or just couldn't smell, the grouse was too dazed to know but the greatest danger seemed to have passed. The cat was down at the water's edge now and the grouse could clearly see that it was thirsty. As the lynx lowered its head to drink there was a sudden explosion in the water barely six inches away. The otter had surfaced in surprise. Instantly the giant lynx let out a piercing scream and stabbed the otter in the face with a powerful claw. But the otter was swift and caught the lynx by the throat, and shaking its head vigorously, hauled the big cat into the pond.

It was a dramatic struggle. The lynx was off balance and could hardly have kept from falling in. The splash shook the beasts loose but they came back more determined than ever. The lynx was at a disadvantage, half swimming and half loping, but it managed to pelt telling blows upon the otter. But the enemy was fast and tough and buried its murderous teeth in the throat of the lynx again and again. The fight continued out into deep water, both antagonists clawing, ripping, spitting like demons. Slowly the thrashing fighters drifted toward the dam and reaching it, parted almost as quickly as they met, each bounding off in different directions on the beaver dam.

The grouse could hear the otter sound its painful cough as it galloped off the dam and down the creek past the hemlocks and out of hearing. The lynx had had enough too and bolted crazily through the underbrush, up the ridge and into the deep woods beyond.

The moon had fallen considerably, dawn was approaching. Warmth stole once more over the grouse and the paralysis left her. It was good to feel the eggs again and to settle over them with relaxed muscles. As she did so, there was a pricking against her breast—a small beak was hammering its way through a dry shell. The grouse settled down more comfortably, joy in her heart. Her long wait was about over, new life was beginning. The long shadows from the hemlocks vanished and the only audible sounds in the gray dawn were the sifting breeze through the laurels and the gentle lapping of the water against the drumming log.

IN THE PATH OF THE RED DEMON

(*Continued from page* 9)

of 1950's forest fires. A cigarette tossed into dry leaves is likened to a slow-burning fuse, a fuse that might burn for twenty minutes and then touch off the powder keg.

The second greatest cause of fire is careless brush and trash burning. The 4 o'clock burning law, in effect from March 1st to May 15th, has been of tremendous value in decreasing the number of fires escaping from brush burning operations. This law prohibits the burning of trash or any inflammable material, capable of spreading fire, located within 300 feet of any woodland except between the hours of 4 o'clock P.M. and 12 o'clock midnight. A lot of people use little or no judgment in selecting a site in which to burn trash or dump hot stove ashes. A high wind can carry hot sparks for a considerable distance. Forest fires have been known to start five miles in advance of the head of the mother fire.

More homes should be equipped with an incinerator for use in burning trash. The incinerator can be an elaborate brick structure or a discarded oil drum

(*Continued on page* 24)

IN THE PATH OF THE RED DEMON

(*Continued from page 23*)

with a tight woven wire mesh top to prevent pieces of burning material from blowing out. Hot stove ashes should not be dumped outside on dry windy days and, regardless of weather conditions, it is advisable to drench the ashes with water before leaving the area.

Other causes of forest fires are inadequately protected fires around sawmills, children playing with matches, washpot fires, hunters smoking game out of hollow trees, railroad engines, and, of course, miscellaneous fires caused from defective flues in homes, plane crashes and automobile backfiring, to mention a few.

The "Red Demon" of the forest can be cornered but he is a fierce foe. The best method of handling such an adversary is to prevent his getting started.

Virginia has had her share of large forest fires. In 1943, a fire escaped from a defective flue in a small cook shanty at a cooperage mill in Sussex County. The fire swept through 12,000 acres of forest land in less than 8 hours. Did many of the forest animals escape, were many nests destroyed in the nightmarish ride of the "Red Demon"?

There are acres and acres of unbroken tracts of timberland which, when "touched off" on a dry windy day, would be extremely difficult and costly to stop. There are any number of homes and rural communities completely surrounded by forest land. Unless everyone remembers to be careful these communities can become a second "Bar Harbor" (the terrible catastrophe of 1947, when 3,500 people fled the famed Maine resort to escape the red menace which destroyed 250,000 acres of forest land, burned $10,000,000 worth of property and took 16 lives.

Keeping Virginia's forests productive and protecting Virginia's wildlife is the job of every man, woman and child. To assist in this tremendous task it is necessary that everyone obey the fundamental rules of forest fire prevention by *Breaking Your Match, Drowning Your Campfire, Crushing Your Cigarette, and Burning Trash and Brush Carefully.* Also, it is necessary that the uninformed be informed. Everyone should be interested in spreading the gospel of forest and wildlife conservation and only after everyone is informed and practicing conservation techniques can Virginia's forests be kept green.

Another left! The right ones don't seem to be biting today.

OUTDOOR EDUCATION IN REALITY

(*Continued from page 17*)

ulum. Rapport must be won on the local community level before the antagonisms of races, poverty, ill health, and ignorance can be erased among nations.

Our fathers bequeathed forests, water, and the good earth. In many instances we have not been good custodians. We have not inherited material things only. Our forebears also bequeathed the free public school. More recently parks, playgrounds, and public school camps have been handed down, but not in every community. There are federal government agencies who stand ready to give technical advice on soil conservation. There is the State Commission of Game and Inland Fisheries who publishes a monthly magazine for higher standards of outdoor recreation through wildlife conservation. These government agencies do not dictate to to you from a Moscow.

First of all you have to recognize that youth has a right to fish, for example. Then the desire to fish may have to be created. Then you write to the chief of the fish division for the "know-how." He is anxious to assist in the techniques of planning whether it be the individual student, the group, or the community. There is the excellently illustrated *Virginia Wildlife* magazine with its school page. That is not a "Tass" agency either. All these facilities exist to help. They will help you to get the slant on a fish pond and human relations. There may be ethnic groups within the community that do not understand that a fish pond and its products is akin to raising cultivated strawberries or blueberries. This is called interpreting community life and consumer literacy or good public relations.

A school pond not only can produce fish, but swimming, boating, waterfowl, skating, and scenery. It can be a source of physical and mental health.

Obviously the unit involves language, science, mathematics, art, and the democratic way of life. We have the opportunity to awaken the spirit of determined cooperation. We face the task of taking judicious care of our natural resources. Most of all we need to restore faith in the American way. We can provide the "way" in "reality" by teaching and by example. Ours is a great opportunity to justify the free public school of Horace Mann.

Circulation Drive by Game Wardens Going Strong

The current circulation drive for *Virginia Wildlife* by Virginia's game wardens got well under way during the month of April. The Southwest District scored top honors for the month, with a total of 302 subscription sales turned in. The Piedmont District was second, with 114 subscriptions sold.

Warden Sam T. Dobyns of Patrick County was the star salesman for the month, with a total of 200 subscriptions credited to him. Warden C. S. Harmon of Roanoke County was second with 40 subscriptions turned in.

Bath County Officials Aid in Wildlife Restoration Work

The Board of Supervisors of Bath County has given wildlife restoration and conservation work a big boost by their recent action in voting the sum of $1,450 for wildlife aid in the county.

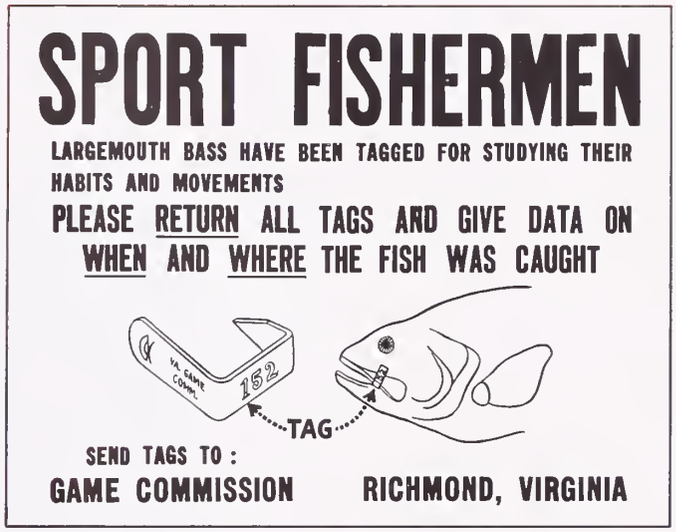
The money will go to provide a sum of $500 to be allotted in awards of $100 each to the first five people giving information to the warden or the sheriff leading to the arrest of violators for spotlighting; to provide $100 for the purchase of seed for wildlife planting which will be in addition to the seed provided by the Game Commission; $300 of the money will go to purchase twenty per cent super phosphate to go on the food plantings; $50 will purchase mineralized salt for deer; and $500 has been set aside to hire labor and teams to put in the plantings.

Mr. P. C. Manly, county agent for Bath, is distributing the seed supplied by the Game Commission.

Fishermen Asked to Cooperate in Back Bay Fisheries Study

With the opening of the bass season this month, Virginia fishermen are asked to cooperate with the Commission in its fish study work now under way at Back Bay in the southeastern corner of the state.

Some 2,000 largemouth bass now swimming in the waters of the Bay wear a numbered tag placed there by technicians of the Commission's Fish Division. Persons catching tagged fish are asked to return the tags to the Commission.



Signs like the one above have been posted in the Back Bay area. Sportsmen are requested to cooperate with the Commission and return tags in the interest of better fisheries management for that famous fishing water.

Two Norfolk sportsmen's organizations, the Tidewater Anglers Club and the local Izaak Walton League chapter, have agreed to offer prizes for the return of tags from the marked fish.

Studies made with the aid of the tagging program are expected to give the Commission many of the answers about the bass population in the popular fishing water.

Dr. Dean Rosebery, assistant chief of the Fish Division, who will be in direct charge of the work, did a similar study on the fish populations of Claytor Lake in Pulaski County during 1949. His findings at that time have had a direct effect upon the present management of the fishing in that water.

Two Changes Made in Warden Force

A retirement and a resignation have brought two new men to the law enforcement division of the Commission.

Mr. Claude Beverly recently retired as game warden of Dickenson County, and has been replaced by Mr. Otto Kendrick of Isom.

In Isle of Wight County, Mr. C. F. Hall resigned from the division in order to go into private business. Mr. H. E. Munford, of R.F.D. 2, Windsor, was appointed to fill the vacancy left by Mr. Hall's resignation.

for
Students
Teachers
Parents

BIRD OF THE MONTH

The Killdeer

ONE of the birds that should be familiar to every Virginia boy and girl is the killdeer. A bird just a little larger than a robin, he is found all over the United States, from the Atlantic to the Pacific and from the Gulf of Mexico up to Canada. He is to be found in the pastures and fields throughout the Old Dominion and along the beaches also, because he belongs to a group of shore birds called the plovers.

The killdeer is fairly common now, but at one time the plovers were considered game birds, and heavy and excessive hunting at that time reduced the killdeer population to a dangerously low ebb. Since the plovers have been placed under protection, the population has risen until at the present time the killdeer once again can be found almost everywhere.

The killdeer is a striking looking bird, and is very easy to identify. He has a brown head and back, blending into orange toward the tail, a white neck ring and a white breast with two black bands across the upper part just below the throat.

When he flies he displays his long striped wings and usually utters the distinctive penetrating cry that gives him his name, "kill-dee, kill-dee, kill-dee."

The nest of the killdeer, like that of most of the shore birds, is just a hollow depression in the earth in which the four eggs are laid. It can be anywhere in a field or pasture, and is often difficult to find because the eggs are splotched and marked with brown to blend in with the earth.

The killdeer is one of the birds that employ "broken wing" tricks to lure intruders away from the nest, and they are quite good at it. They will run along the ground a short distance in front of the stranger, crying until they have led him out of the vicinity.

The young of the killdeer are precocial, that is, they are able to get up and run around and take care of themselves

almost from the moment they are hatched. The young of most game birds have this ability also, as contrasted with the songbirds, where the babies are helpless in the nest for weeks.

WARDEN BILL'S PATROL

Well, boys and girls, this is the month when school lets out and another nice long lazy summer stretches ahead of you. There'll be picnics in the woods, swimming down at the old swimming hole in the back creek, and some fishing there too. There'll be all kinds of hikes to take and perhaps a camping trip for real enjoyment.

All those things are fun to do and worth looking forward to, but did you ever stop to think how closely Old Mother Nature is tied into all of them?

Where would the pleasure in picnicing or hiking be without the cool shady woods to offer shelter and rest? And as for swimming or fishing in the back creek—well, it takes some good sound conservation practices to keep the creek clear and free of pollution, and fit for either swimming or fishing.

Much of the pleasure in a hike or a camping trip lies in seeing and observing the wildlife in the fields and forests. Just imagine what a dull time we would have if there were no birds or animals to lend excitement and beauty to the landscape. Now I don't mean to make this a lecture, but when you're enjoying some of that good summer fun this year, just give a little thought to the part nature plays in it—and do a little bit for conservation—won't you?

Part of the enjoyment of getting out-of-doors in the summer is the opportunity it gives you to study and learn about nature. Last year at this time we mentioned a few books that can add much to any field trip, and it would probably be a good idea to list them once again. The list includes the "Field Book of North American Mammals," by H. E. Anthony; the "Field Book of American Trees and Shrubs," by F. Schuyler Mathews; and the 'Field Guide to the Birds," by Roger Tory Peterson.

TEACHERS' CORNER

We're going way out on a limb and recommend that every school get a copy of "Conservation Education in American Schools," the twenty-ninth yearbook of the American Association of School Administrators which has just been published. The book should prove an invaluable guide to conservation education.

Ten chapters treat the subject in a most complete manner, and three appendices offer listings of conservation education references, audio-visual materials and their sources, and organizations and agencies concerned with conservation

Address of the American Association of School Administrators is 1201 Sixteenth St. N. W., Washington 6, D. C. Price of the book is $4.00.

Certificate of Merit Awards

4th Annual Wildlife Essay Contest

Sponsored by the Virginia Commission of Game and Inland Fisheries and the Virginia Division of the Izaak Walton League

County	Name	School
Albemarle	Alberta Chapman	Albemarle Training School
Alleghany	Carol Bowen	Jeter Junior H.
	Rosalie Landis	" " "
Amherst	Virginia Lee Cahill	Madison Heights H. S.
	Carrie Iona Lee	" " " "
	Ethel Mae West	" " " "
	Amelia Mae Parrish	" " " "
Arlington	Jean Pallange	Washington-Lee H.S.
	Benjamin Hardy	Stratford Junior High
Augusta	Barbara Samaras	R. E. Lee H. S.
	Dorothy Mullenex	Wilson Memorial H. S.
	Doris Ann Craun	North River H. S.
	Audrey Coffey	Wilson Memorial
	Walter Hoesel	Jefferson Grammar
	Shirley Ann Stanley	Wilson-Jackson
	Becky Roadcap	Beverley Manor
	Mildred Yeakley	Thomas Jefferson Grammar
	Gail Hayman	" " "
Bedford	Dorothy Perry	Bedford H. S.
	Phyllis Wilson	Big Island H. S.
	Barbara Jean Laughon	Huddleston H. S.
Buckingham	Bobbie Glover (f)	Buckingham Central H. S.
	Kitty Shumaker	" " " "
	Jean Toney	" " " "
	Jackie Coleman (f)	" " " "
	Elizabeth Harris	Buckingham H. S.
Campbell	Mildred Noel	E. C. Glass H. S.
	Shirley Minnick	" " " " "
	William C. Perkins	" " " " "
	Jim Massie	" " " " "
	Grace J. White	Dunbar H. S.
	Nellie Watson Finch	Concord H. S.
	Jane Cure	E. C. Glass H. S.
	Larry Farmer	" " " " "
Carroll	Patsy Golding	Lambsburg
	Janice Cochesham	"
	Charles Easter	"
	Georgia Hawks	"
Charlotte	Nason Arrington	Randolph Henry H. S.
	Mary Hansen	" " " "
	Edward Powell	Wylliesburg
	Edith Ann Guthrie	"
	Joann Smith	Randolph Henry H. S.
	Grace Dixon	Keysville Elementary
	Rebecca Newcomb	Wylliesburg
Chesterfield	Alfred Krause	Colonial Heights
Culpeper	William D. Gilbert	Culpeper H. S.
Fairfax	Sally Boyce	Fairfax H. S.
	Choloe Myers	Madison Elem. (Falls Church)
Fauquier	Robert Courtney	Warrenton H. S.
	Jimmy Shumate	" "
Fluvanna	Billy Bell	Columbia District
	James Morris	" "
	Cary Bell	" "
	Dickie Quick	" "
	Ann Walton	" "
	Helen Johnson	" "
Frederick	Sarah Marks	James Wood H. S.
	Margaret Brumback	" " " "
	Jeanne M. Kline	Handley H. S.
	Sarah Anne Getzendanner	" " "
	Beatrice Fincham	James Wood H. S.
	Sharon Driskell	" " " "
	Mary Ellen Lynn	" " " "
	Evelyn Jenkins	Stephens City
	Edna Shanholtz	James Wood
	Irene Brill	" "
Giles	Nancy Jane Williams	Newport H. S.
Gloucester	Dolores Robbins	Botetourt
	Grace Secord	"
	Delores Kemp	Botetourt H. S.
Greensville	Bunny Johnston	Emporia Elementary
	Peggy Ann Poole	" "
Hanover	Frances Beazley	Beaverdam H. S.
	Edna D. Hall	Battlefield Park H. S.
	Jean Murphy	Beaverdam H. S.
	Betty Young	Battlefield Park
	Nancy Denton	" "
	Milton Barden	" "
	Claytor Hall	" "
	Pauline McGehee	" "
	Jacquelin Hayes	" "
	Buddy Young	" "
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	Barbara Clements	" " "
	Virginia Clements	" " "
	Anne Stanley	" " "
	Margaret Stanley	" " "
	Hilda Corker	" " "
	Sandra Rice	" " "
	Danny Terry	Doswell School
	Charles Lancaster	" "
Henrico	Julia Ann Minter	Glen Lea Annex
	Pattie Lou Jernigan	" " "
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Henry	Gladys Gravely	Axton H. S.
	Linda Reynolds	" " "
James City	Cynthia Ann Slater	Toano H. S.
	Violet Lee Moore	" " "
	Peggy Ann Crowell	" " "
	Carol Lucille Levorsen	Toano H. S.
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	Margaret Ann Moore	Dahlgren Elem.
	Gordon Barker	Dahlgren
King & Queen	Nellie Mae Mitchell	Marriott
	Jack Hutchinson	Marriott H. S.
	Marjorie Lee Broache	Marriott
	Russell Leland Wyatt	Pleasant Hill H. S.
Lunenburg	Mary Della Lacy	Victoria H. S.
	Bebe Glover	" " "
	Joe Wilkinson	Kenbridge H. S.
	Lois Baisey	Victoria H. S.
	Betty Pritchett	Kenbridge
	Jimmy Allen Spencer	Kenbridge H. S.
	John Ray Shields	" " "
Madison	Emily McMullen	Madison Co. H. S.
Mecklenburg	Eunice Vaughan	Chase City H. S.
	Harrison Braxton	" " " "
	Myrna Inge	" " " "
	Mason Hutcheson	Boydton H. S.
	Frances S. Best	La Crosse H. S.
	Brenda Roark	Chase City Junior H.
	Joyce McGee	" " " "
	Louise Jeffrys	" " " "
	Cecilia Hoyle	" " " "
	Clinton Pennell	" " " "
Norfolk	Shirley Jean McKenzie	Norview H. S.
Norfolk (City)	Ann Barrett	James Monroe
	Jessica Scarborough	" "
	David Steele	Simonsdale Elemen.
Patrick	Claudia Layman	Hardin-Reynolds
	Betty Ruth Bryant	" "
	Nancy E. Nelson	" "
	Ann Sheppard	" "
	Sanford Martin	" "
	Ray Sheppard	" "
	Betty Wiggington	" "
	J. E. Maxey	" "
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	Phyllis Ann Glenn	" " "
	Lois Hubbard	" " "
	Betty Durfee	" " "
	Ronald C. Coleman	" " "
	Barbara Donald	" " "
	Lucille Simpson	" " "
	Frances Wilson Spindler	" " "
	Alice Newman	" " "
	Sarah Brisentine	" " "
	Ann Dickerson	" " "
	Ellen Hamlett	" " "
	Janice Susan Hudson	" " "
	Roberta Grace Prim	" " "
	Betty Ann Fretwell	" " "
	Allen Dahl	Farmville Elem.
	Evelyn Price	" "
Prince George	Helen Annetta Benesek	Disputanta
	Leroy Harrison	"
Princess Anne	Miriam Bell	Kempsville H. S.
	Anne Byrum	" " "
	Linda Yoder	" " "
	Dorothy Fairer	" " "
	Geraldine Whaley	" " "
	Pat Saunders	" " "
Prince William	Bradley Baker	Osbourne H. S.
	Dolores Wright	Brentsville District H. S.
	Eleanor Lee Caton	Osbourne H. S.
	Philip Barksdale	" " "
	Pattie L. Adams	Bennett School
	Susan Galleher	" "
	Sue Breeden	Bennett
	Connie Wynn Kincheloe	"
	Martha Jean Helms	"
	Bobbie Allison	"
	John Wermuth	Quantico Post School
Roanoke	Cecil Bower	Andrew Lewis H. S.
	Rockla Thompson	South View
	Betty Lou Vinyard	" "
	Gene Hylton	Highland Park
Rockbridge	Frances Banks	Parry-McCluer
	Geraldine Taylor	" "
	Sylvia Sandidge	" "
	Sheila Rogers	" "
	Betty Burch	" "
	Iris Green	" "
Rockingham	Tommy Simmons	Centerville School
Spotsylvania	Margaret Knight	Spotsylvania H. S.
	Carolyn Curtis	" " "
	Hazel Peeke	" " "
	Catherine Weimer	" " "
	Joyce Anne Wright	" " "
	Joyce Russell	James Monroe H. S.
	Georgia Alvis Weimer	Spotsylvania H. S.
Warren	Betty Burgin	Warren County H. S.
	Julian Stoutamyer	" " " "
Warwick	Virginia McMahon	Warwick H. S.
Wise	Jackie Hatfield	Wise H. S.
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